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Self-Esteem, Resilience, Social Support, and Acculturative Stress as
Predictors of Loneliness in Chinese Internal Migrant Children:
A Model-Testing Longitudinal Study

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Abstract

The present study examined the risk and protective factors of loneliness among Chinese internal migrant children (CIMC) in Beijing, China, including self-esteem, resilience, social support, and acculturative stress. Longitudinal survey data were collected from a large sample of 4th, 5th, and 6th grade CIMC from three schools in Beijing, at four time points ($N = 862$ at T1 to $N = 837$ at T4) over a 20-month period. Grounded in the Cultural and Contextual Model of Coping (Heppner et al., 2014) and the Acculturation Theory (Berry, 1997), two predictor models of loneliness were tested with path analysis. The results yielded the following: a) the two predictor models fit the data well; b) CIMC's T1 self-esteem and T1 resilience protected them against loneliness at T4; and c) CIMC's T2 social support seeking was a significant mediator between self-esteem and loneliness, and between resilience and loneliness; and d) similarly, CIMC's T3 acculturative stress was a significant mediator between self-esteem and loneliness, and between resilience and loneliness. The study's results highlight the merit and importance of implementing theoretically-guided, model-testing research grounded in a prospective research design, to help advance CIMC research. Implications for future research on and practical support for CIMC are discussed.

Introduction

While internal migration is a global phenomenon, its scale and impact are most conspicuous in Mainland China (International Organization for Migration, 2018). In 2014, one in five Chinese citizens in China were rural-to-urban migrant workers (National Bureau of Statistics, 2015). More recent data in 2020 shows that this Chinese internal migrant population has now grown to 290 million (National Bureau of Statistics, 2020). As many of these adult migrant workers in China relocate to major cities for economic reasons, their accompanying children face a multitude of social, developmental, academic, health and cultural adjustment challenges (Zhang et al., 2019). There is a limited but growing body of research, both within Chinese and international literatures, that focus on the psychosocial adaptation and well-being of children of migrant workers in China—hereafter referred to as “Chinese internal migrant children” (CIMC) (see reviews by Sun et al., 2016; Wang & Mesman, 2015).

Studies have found that CIMC are highly disadvantaged and vulnerable. For instance, CIMC experience various unique social and acculturative stressors (Zhong et al., 2016), such as loneliness and social anxiety (Zhang et al., 2019) due to discrimination, social isolation, and social exclusion (Li & Jiang, 2018; Zhuang & Wong, 2017). Compared to non-migrant, urban Chinese children and adolescents, CIMC consistently report poorer mental and physical health (e.g., Sun et al, 2016; Zhang et al., 2019). Despite the growing understanding of and attention on the adaptation and welfare of CIMC over the past 15 years, the *pathways* and *mechanisms* underlying CIMC’s adjustment and well-being in urban areas remain understudied and not well understood (Zhang et al., 2019). Accordingly, researchers have called for the use of more nuanced multivariate research designs to examine the impacts and interactions of individual, developmental, social, and cultural factors in CIMC’s well-being (Sun et al., 2016), including

loneliness (Song, Fu, & Wang, 2018) and social support (Zhuang & Wong, 2017). Meta-analyses of CIMC studies, however, have found a shortage of longitudinal designs (e.g., Wang & Mesman, 2015). For example, in Sun et al.'s (2016) meta-analysis of studies examining the impacts of internal migration on CIMC, only three of the 25 studies published between 2006 and 2015 had a longitudinal prospective design, with the rest being cross-sectional. Therefore, prospective research designs are underutilized and sorely needed in this area of research (Fang, Sun, & Yuen, 2017).

The current study sought to examine potential predictors of CIMC's loneliness, which is a critical measure of their psychosocial well-being in their urban resettlement. Loneliness has been identified as a common indicator of social and emotional health among children and adolescents in general (Vanhalst et al., 2013), but also with CIMC specifically (Li & Jiang, 2018; Zhang et al., 2019). In the present study, we attempted to build on and extend existing CIMC research by incorporating the following methodological and conceptual improvements: a) recruiting a large sample of 4th and 5th grade CIMC across three schools in Beijing, China; b) collecting data from this CIMC sample across four time points over a year and eight months; c) formulating two conceptually informed predictor models of loneliness grounded in the Cultural and Contextual Model of Coping (CCMC: Heppner, Wei, Neville, & Kanagui-Muñoz (2014) and the Acculturation Theory (Berry, 1997); and d) employing path modelling to assess the mediating effects of social support and acculturative stress on the relationships between self-esteem, resilience and loneliness within these hypothesized models. In short, the present study endeavors to: 1) offer a nuanced examination of potential risk and protective factors of loneliness in CIMC; and subsequently 2) to shed light on the processes and effects of rural-to-urban adaptation for CIMC in the capital of China. To these ends, we tested two multivariate path models using

longitudinal data collected over 20 months across four time points. First, we hypothesized that CIMC self-esteem at Time 1 would predict their social support seeking at Time 2. This, in turn, would affect CIMC's acculturative stress at Time 3 and their experience of loneliness at Time 4 (see Figure 1). In a parallel model, we hypothesized that CIMC's resilience at Time 1 would impact their social support seeking at Time 2. This, in turn, would affect CIMC's acculturative stress at Time 3 and loneliness at Time 4 (see Figure 2).

Social and Historical Contexts of Internal Migrant Children in China

Reform and urbanization since the late 1970s have pushed Mainland China into unprecedentedly rapid economic and social development. The migration of parents and their children from rural to urban areas is a consequence of this dramatic societal change (Zhong et al., 2016). Chinese internal migrant children (CIMC) are defined as children and adolescents aged 6 to 18 years old, who migrate to urban areas with their working parents. These children's household registration, or '*hukou*' in Chinese, is either in the rural villages in another province or in counties outside of their urban place of residence (Ministry of Education of China, 2015). According to the 2010 Mainland Chinese census data, the number of CIMC aged 0 to 17 was 35.81 million (Research Group of All-China Women's Federation, 2013), accounting for roughly one eighth of children in China and three in ten children living in Beijing alone (Duan, Lu, Wang, & Guo, 2013; Ministry of Education of the People's Republic of China, 2020).

The psychosocial and cultural changes associated with rural-to-urban transition have direct impacts on the physical, mental and emotional well-being of CIMC, as well as their social and academic functioning (e.g., Song et al., 2018; Zhuang & Wong, 2017). For example, CIMC fare worse than their urban, non-migrant peers with respect to self-esteem, resilience, loneliness, problem behaviors, social adaption, and academic performance (Shi, Wang, Liu, & Kang, 2014).

These findings are supported by a meta-analysis conducted by Wang and Mesman (2015), where the authors found that CIMC reported lower levels of emotional well-being, social functioning, and school function in comparison to urban-born children. These researchers posited that the stress from economic pressure and adaptation to the urban lifestyle may be the main risk factors for physical and mental health problems in CIMC.

Studies have also begun to provide clues for potential variables that affect CIMC's mental health and well-being; these variables include, but are not limited to: migrant children's individual characteristics (e.g. self-esteem and resilience), coping strategies, and perceived acculturative stress (Shi, Wang, Liu, & Kang, 2014; Wang, Dan, & Suo, 2016). With respect to individual factors, Ye (2011) has identified personality characteristics and coping style to be the main contributing factors to CIMC's mental health. In terms of CIMC's resilience, research has found resilience to protect against internalized problems, such as depression and loneliness (Wang, Gene, & Lin, 2014), and to facilitate cultural adaptation (Wang, Lin, & Li, 2016). In short, a review of the CIMC literature clearly suggests that CIMC's health and psychosocial well-being result from interactions among several individual, cultural, and contextual factors.

Conceptual Frameworks

The multilayered and interactive nature of CIMC's cultural adjustment calls for culturally-informed and multidimensional conceptual frameworks to help guide CIMC research. In this study, we adopted and applied the Cultural and Contextual Model of coping (CCMC) by Heppner et al., (2014) and the Acculturation Theory by Berry (1997), to guide our testing and analysis of the hypothesized predictor models of loneliness. The following sections briefly describe these two conceptual frameworks.

The Cultural and Contextual Model of Coping (CCMC). The CCMC is a comprehensive model of coping and adaptation that emphasizes the role of culture (Heppner et al., 2014), which aligns with emerging evidence on culture's impact on the stress-coping process (Kuo, 2011, 2014). The CCMC stipulates five domains that contribute to coping and adaptation: 1) Domain A: Individual Factors; 2) Domain B: Environmental Factors (i.e., Immediate Relationships, Working and Living Environments, and Macro Sociocultural Context); 3) Domain C: Stressor(s); 4) Domain D: Coping (including coping strategies and social support); and 5) Domain E: Health Outcomes (e.g., psychological and physical well-being, depression, anxiety). Aside from the comprehensive coverage, the CCMC also highlights interactions between the five domains and provides a conceptual framework to test relationships among variables across the domains over time. The multi-dimensional and the process-focused attributes of the CCMC makes it particularly well-suited for guiding longitudinal research, such as the path modeling design (Heppner et al., 2014) employed in the present study.

Acculturation Theory. The Acculturation Theory (Berry, 1997) further complements the present study by viewing CIMC as undergoing a rural-to-urban cultural transition. Acculturation refers to the cultural and psychological changes that occur when two or more cultural groups and their members come into contact (Berry, 2006). Recent research by Fang et al., (2017) has underscored the relevance, yet a lack of acculturation framework in conceptualizing the rural-to-urban adaptation of CIMC (Fang et al, 2017). Acculturation Theory is particularly relevant to the present investigation of CIMC in that it hypothesizes that the quality of migrants' long-term cultural adaptation can be facilitated or obstructed by moderating variables *prior to* and *during* the process of acculturation (Berry, 1997, 2006). The theory stipulates that migrants' status in the host society, demographics, and trait variables can interact with other moderating variables

during cultural transition, such as migrants' acculturation strategies, social attitudes, coping strategies, and social support (Berry, 1997). Furthermore, acculturation theory stipulates that acculturative stress to be a common emotional and behavioral consequence of cultural change and acculturation (Kuo, 2014). To the authors' knowledge, however, only a handful of studies have incorporated acculturation theory into studying the adaptation and well-being of CIMC (e.g., Gui, Berry, & Zheng, 2012; Fang et al., 2017; Zhong et al., 2016).

Therefore, we adopted the CCMC and the Acculturation Theory to guide the model-testing analyses and the interpretation of findings in this study. In the following sections, we review the key variables of the present research.

Review of the Study's Variables

Self-esteem. Self-esteem is one's subjective evaluation of oneself (Rosenberg, 1965)—an individual factor (Domain A). Self-esteem can involve individuals' cognitive beliefs about oneself (e.g., "I am smart") and emotional reactions in response to oneself (e.g., pride). Self-esteem has been found to be a crucial protective factor against negative psychosocial outcomes (including loneliness) in Dutch adolescents (Vanhalst et al., 2013). For CIMC, recent studies have supported the role of self-esteem on mitigating mental health problems (e.g., Fan, Chen, Tang, Huang, & Yuan, 2016). These findings are consistent with the results of several studies with Chinese college students that found a negative relationship between self-esteem and loneliness (Kong & You, 2018; Zhao, Kong, & Wang, 2013). Therefore, we hypothesized that CIMC's self-esteem would be related to their interpersonal and psychological well-being as measured by loneliness and social support during their cultural transition.

Resilience. Resilience is an individual-level, personality trait (Domain A factor).

Trait resilience involve “personal qualities that enable one to thrive in the face of adversity” (Connor & Davidson, 2003, p.76); resilience can vary with life circumstances, context, time, age, gender, and cultural origin. Trait resilience has been found to be associated with more active coping (e.g., problem-solving or seeking social support to change the stressor) in students in China and Taiwan (M.-H. Li & Nishikawa, 2012; M. Li & Yang, 2016). A recent study showed that CIMC with high levels of resilience reported less internalizing problems, including loneliness and depression (Hu, Li, Guo, & Lin, 2017), similar to previous research (e.g., Tam, Lin, Li, & Benotsch, 2019; Wang, Gening, & Lin, 2014). Moreover, findings from studies of Chinese participants also hinted at the relationships between resilience and self-esteem, and between resilience and coping. For instance, in one study by Liu et al., (2014) self-esteem was found to mediate the positive relationship between resilience and life satisfaction in undergraduate students in China (Liu et al., 2014). Evidently, resilience is a critical individual factor in adaptation and coping of Chinese individuals, including CIMC.

Social support seeking. The role of social support in mitigating distress and negative health outcomes have long been established (Kim et al, 2008), including in recent CIMC research (e.g., Song et al., 2018). Social support is a Domain D factor in the CCMC, as a coping strategy. In a cross-sectional study of 450 CIMC in the province of Xinjiang, migrant children’s social support had direct positive impacts on psychological resilience and adjustment (Song et al., 2018). At the same time, CIMC in Beijing reported receiving less social support from family members and peers compared to urban children (Zhuang & Wong, 2017). The authors attributed CIMC’s lower social support to a loss of peer networks due to migration and migrant parents’ lower ability to establish strong connections with their children due to work demands. Nevertheless, support from family, peers, and teachers were all significant protective factors for

CIMC's mental health in that study. Interestingly, a study of 301 CIMC highlighted that perceived support from teachers was the most significant predictor of school satisfaction and integration, beyond the influences of migrant children's self-esteem and hope (Fang et al., 2016). Although showing robust evidence for the role of social support for CIMC, most of these studies were cross-sectional. Therefore, in this study, we addressed this gap by using a longitudinal, prospective design.

Acculturative stress. According to the Acculturation Theory, acculturative stress is a common emotional consequence of cultural transition (Kuo, 2014). However, to date and to our knowledge, there are no published, empirical studies that have systematically assessed and examined acculturative stress among CIMC. Acculturative stress has nevertheless been found in unaccompanied adolescent international students of Chinese descent who migrated to Canada from Taiwan, Hong Kong, and Mainland China (Kuo & Roysircar, 2004 & 2006). For instance, in a study by Kuo and Roysircar (2006) the authors found that Taiwanese unaccompanied adolescent sojourners' acculturative stress was directly predicted by their perception of prejudice experienced and their education-related acculturation (e.g., familiarity with Canadian educational system) in Canada. Furthermore, the effects of prejudice and acculturation on these young sojourners' acculturative stress was significantly mediated by their interpersonal competence, which included their social support and social/interpersonal skills and effectiveness. Some scholars have observed and postulated that acculturative stress experienced by CIMC largely stems from systemic inequity and discrimination (Fang et al., 2016, 2017; Zhong et al., 2016). These include: 1) widening economic and financial gaps between migrant and non-migrant children in China; 2) limited rights and accessibility to public and social supports; and 3) social discrimination experienced in the urban areas; and 4) loss of familial support and cultural and

communalistic traditions. To better understand the role of acculturative stress in CIMC's emotional well-being, the present study employed a validated scale to measure CIMC's acculturative stress and evaluated the mediating effect it has on migrant children's loneliness.

Loneliness. Loneliness (Domain E, health outcome) is a common experience for adolescents and is a critical indicator of adolescents' mental health (Vanhalst et al., 2013). Loneliness is the negative emotion associated with a sense of lacking interpersonal relationships and networks (Kapikirn, 2013). That is, there is a discrepancy between the social connection that individuals desires versus what they have (Peplau & Perlman, 1982). By virtue of CIMC's marginalized status in the urban environment, loneliness has been found to be prevalent in CIMC due to social isolation (Zhuang & Wong, 2017) and social exclusion (Li & Jiang, 2018). Other researchers have observed that CIMC's perception of discrimination and mobility (i.e., frequent moving and uprooting) were related to loneliness (e.g., Hu, Fang, Lin, et.al, 2009; Hou, Yuan, Liu, et.al, 2011). While these findings highlighted loneliness as a critical and common experience in CIMC, they were mostly drawn from cross-sectional research. In this study, we extend these previous findings by assessing predictors of CIMC's loneliness using a longitudinal, prospective design.

The Current Study

The present study adopted a conceptually-informed, model-testing, and longitudinal design to examine the risk and protective factors of loneliness in CIMC in Beijing, China. Specifically, this study analyzed the mediating relationships among five variables related to adaptation: self-esteem, resilience, social support, acculturative stress, and loneliness. Further, this study tested two hypothesized path models involving the aforementioned variables, as guided by the Cultural

and Contextual Model of Coping (Heppner et al., 2014) and the Acculturation Theory (Berry, 1997; Kuo, 2014).

We proposed two path models of loneliness. In Model #1 (Figure 1), we hypothesized that being faced with rural-to-urban migration (Domain B, Environmental Factor), CIMC's self-esteem (Domain A, Individual Factor) at Time 1 will affect social support seeking (Domain D, Coping Strategies) at Time 2. These relationships in turn, will impact CIMC's acculturative stress (Domain D, Stressor) at Time 3, as well as their psychological well-being as measured by loneliness (Domain E, Health Outcomes) at Time 4. Similarly, in Model #2 (Figure 2) we hypothesized that CIMC's resilience (Domain A) at Time 1 will predict social support seeking (Domain D) at Time 2; this, in turn, will predict CIMC's experience of acculturative stress (Domain D) at Time 3 and their loneliness (Domain E) at Time 4. With these two multivariate models, path analysis was employed to examine the causal relationships among the identified variables across four time points in predicting loneliness.

Method

Participants and Sampling

The current study is part of a four-wave longitudinal research of CIMC in Beijing. Data collection occurred over 20 months from October 2011 to May 2013. A convenient cluster sampling method was employed to recruit 4th, 5th, and 6th grade students from three schools in Beijing: one public primary school for migrant children only and two public primary schools with migrant children accounting for about 60% and 80% of the student population, respectively. Based on the China Education Statistics Yearbook (Ministry of Education of the People's Republic of China, 2014), the national average age for the present sample, across the three

grades in China, was estimated to be 10.22, $SD=1.02$.¹ Participants were administered the questionnaires four times in 6-month intervals starting in October 2011. Over the four waves of the data collection, the numbers of participants were $N = 862$ at Time 1, $N= 850$ at Time 2, $N = 906$ at Time 3, and $N= 837$ at Time 4 (see Table 1). Overall, a total of 1429 migrant children completed the survey at least once at a single time point; 1191 completed the survey at 2 time points; 475 completed the survey at 3 time points; and 362 completed the survey at all 4 time points. The demographic characteristics of the sample are presented in Table 1.

Data Collection Process

The present study's ethics, including the participant consent procedure, was established in compliance with the standards of the Institutional Review Board (IRB) of the Faculty of Psychology at Beijing Normal University. On this basis, the following steps were adhered to, to obtain the consent and endorsement of the stakeholders involving in this study. First, the research team delivered an oral presentation about the study and its objectives to the parents or the guardians of prospective CIMC students and to address any questions they might have about the project. Note that, when the study was submitted for the ethics review a parental/guardian written consent was not deemed to be necessary by the university's IRB in view of the nature of the present study with minimal risks. Second, the research team obtained informed consent from the school principals and the classroom teachers from the participating schools. Lastly, informed consent was obtained directly from the student participants before completing the questionnaires in their classrooms at a scheduled time. Trained psychology graduate students from Beijing

¹ To avoid potential confusion and inconsistency in reporting age between 'modern age' (based on the international age system) and 'nominal age' (based on the East Asian Age Reckoning System) by the participants, which often occur with Chinese school students, the participants' grade level information was collected and reported in this study in place of their age. Hence, a national estimate average age of the sample is provided here instead.

Normal University oversaw the data collection process from T1 to T4. Most participants completed the questionnaires in about 40 minutes and each participant received a small gift from the research assistants as a token of appreciation.

Measures

The scales used to assess the predictor and outcome variables in the models of loneliness in this study are described below.

Self-Esteem. The Chinese version of Rosenberg's (1965) Self-Esteem Scale adopted by Wang, Wang and Ma (1999) was used in the current study to measure CIMC's self-esteem. This questionnaire has 10 items and participants responded on a 5-point Likert scale from 1 = "*Highly Disagree*" to 4 = "*Highly Agree*". In this study, the Cronbach's α was 0.74.

Resilience. Resilience was assessed with the Adolescent Psychological Resilience Scale by Hou and Gan (2008). This is a 27-item scale widely used to study adolescent resilience in China, with robust validity and reliability (e.g., Liu, Wang, Xiang, & Song, 2016). This scale had been used to assess resilience of Chinese children and adolescents ranging from 9 to 18 years of age in several previously published studies (see Wang et al., 2014; Ye et al., 2016). The original scale has two subscales: 1) Personal Strength and 2) Strength of Social Support. Since the latter subscale overlaps with the social support seeking measure of this study (described in the next section), only the Personal Strength subscale was used in the analysis. Examples items include: "*I believe life's adversities have a motivating effect on me*" and "*When faced with difficulty I always have plans and strategies to deal with it*". Participants responded on a 5-point Likert scale with 1 = "*Completely Disagree*" and 5 = "*Completely Agree*". Higher scores represent a greater degree of resilience. Cronbach's α for this scale was 0.76 in this study.

Seeking Social Support. CIMC's social support seeking in the present research was measured by the Chinese version of the 8-item Seeking Social Support subscale of the Self-Report Coping Scale developed by Causey and Dubow (1992). The original coping scale was designed to assess the coping behaviors of 4th to 6th grade children in the U.S. Examples items include: "Get help from a friend," and "Talk to the teacher about it." The scale was scored using a 5-point Likert format, ranging from 1 = "Never" to 5 = "Always" with higher scores denoting more social support seeking. This subscale's Cronbach's α in the current study was 0.83.

Acculturative Stress. To measure migrant children's acculturative stress, the revised version of the Social, Attitudinal, Familial, and Environmental Acculturative Stress Scale for Children (SAFE-C) by Chavez, Moran, Reid and Lopez (1997) was employed. This measure was adopted to gauge CIMC's adaptive stress associated with their rural-to-urban transition. The original SAFE-C had 36 items that corresponded to three dimensions: 1) general social stress; 2) acculturative process stress; and 3) perceived discrimination. The scale is scored using a 6-point Likert format, with 0 = "Don't Apply" to 5 = "Bother Me a Lot." To ensure the validity and linguistic equivalence of the Chinese version of the SAFE-C for the current study, multiple rounds of translation and back-translation of the measure were conducted between English and Chinese. Additionally, we conducted an exploratory factor analysis of the Chinese version of the SAFE-C with 339 CIMC and then followed up with a confirmatory factor analysis with 382 CIMC. After removing some items, either due to inapplicability for CIMC or poor item loading, a total of 21 items were retained. Among these retained items, 12 pertain to migrant children's general social stress and nine pertain to acculturative process stress. Cronbach's α for this overall scale was excellent at 0.93.

Loneliness. Loneliness in this study was measured with the Chinese version of the Children's Loneliness Scale (CLS)—a scale originally developed by Asher, Hymel, and Renshaw (1984). In the present research, the 16 loneliness items of the original CLS were adopted. Examples include “*I feel alone,*” and “*It’s hard for me to make friends.*” The measure was scored on a 5-point Likert scale, with 1 = “*Not True at All*” to 5 = “*Always True,*” with higher scores representing more loneliness. Cronbach's α for this scale was 0.75 in this study.

Results

First, we ran correlations among all the key variables in the study (Table 2) and all of the resulting correlations were in conceptually expected directions. The correlations indicate that CIMC’s gender (girls reported more loneliness), resilience at T1, self-esteem at T1, social support seeking at T2 were all significantly negatively related to their reported loneliness at T4. In addition, participants’ acculturative stress at T3 was significantly positively related to loneliness at T4. Further, CIMC’s resilience at T1, self-esteem at T1, social support seeking at T2 were significantly negatively correlated with acculturative stress at T3. Finally, CIMC’s social support seeking at T2 was significantly positively correlated with their resilience at T1 and self-esteem at T1.

Second, we examined the hypothesized Model #1 (Figure 1) with the following relationships in a path modelling design: self-esteem → social support seeking → acculturative stress → loneliness. Path analysis was conducted to assess the data fit with this model. The results showed that the model had good fit [$\chi^2 = 288.43$, $df = 6$, CFI = 1.00, TLI = 1.00, RMSEA = 0.00 (95% CI: 0.00 0.00), SRMR = 0.00]. The standardized coefficients indicated in Figure 1 revealed that high level of loneliness at T4 was negatively predicted by participants’ self-esteem (-0.26) at T1, negatively predicted by participants’ social support seeking (-0.12) at T2, but

positively predicted by participants' acculturative stress (0.35) at T3. Moreover, self-esteem at T1 positively predicted social support seeking (0.32) at T2, but negatively predicted acculturative stress (-0.46) at T3.

A bootstrapping procedure was employed to test the significance of the mediating effect of social support seeking at T2 between self-esteem at T1 and loneliness at T4, and the mediating effect of acculturative stress at T3 between self-esteem at T1 and loneliness at T4. Significant direct paths were identified when the 95% confidence intervals did not include zero (Hayes, 2009). Indeed, social support seeking at T2 had a significant mediating role between self-esteem at T1 and loneliness at T4 (z -score = -5.06, p = 0.000, 95% CI [-0.074 -0.010]). Further, acculturative stress at T3 played a significant mediating role between self-esteem at T1 and loneliness at T4 (z -score = -2.42, p = 0.016, 95% CI [-0.229 -0.104]). However, the mediating effect of acculturative stress at T3 between social support seeking at T2 and loneliness at T4 was not significant (z -score = -0.36, p = 0.717, 95% CI [-0.046 0.027]).

Third, we tested the hypothesized Model #2 with the following relationships: resilience → social support seeking → acculturative stress → loneliness (Figure 2). Similarly, path modelling was conducted to test the data fit with the proposed model. Results show that the model had a good fit [χ^2 = 238.21, df = 6, CFI = 1.00, TLI = 1.00, RMSEA = 0.00 95% CI (0.00 0.00), SRMR = 0.00]. CIMC's loneliness at T4 was negatively predicted by resilience (-0.20) at T1, negatively predicted by social support seeking (-0.12) at T2, but positively predicted by acculturative stress (0.41) at T3. Furthermore, participants' resilience at T1 positively predicted social support seeking (0.32) at T2, but negatively predicted acculturative stress (-0.28) at T3.

Bootstrapping was also conducted for this analysis. Social support seeking at T2 had a significant mediating role between resilience at T1 and loneliness at T4 (z -score = -2.40, p =

0.016, 95% CI [-0.073 -0.007]). Acculturative stress significantly mediated between resilience at T1 and loneliness at T4 (z -score = -4.47, p = 0.000, 95% CI [-0.073 -0.071]). However, the mediating effect of acculturative stress between social support seeking and loneliness was not significant (z -score = -0.96, P = 0.337, 95% CI [-0.007 0.020]). In short, the analyses of the two proposed models revealed comparable patterns of predictive relationships on CIMC's loneliness and among the psychosocial variables in these models.

Discussion

The present study sought to examine the roles of self-esteem, resilience, social support, and acculturative stress in predicting CIMC's loneliness, as a measure of their psychosocial well-being in their urban settlement. Adopting a prospective design, the current study is one of the first to evaluate psychosocial adaptation of CIMC over time. As follows, the study's results have helped expanded our empirical understanding of the critical risk and protective factors associated with CIMC's cultural adjustment and well-being in the following ways.

Protective Factors Against Loneliness

In general, analyses of Models #1 and #2 showed that: 1) the two models help explain factors associated with loneliness in the current sample of CIMC; and 2) for CIMC, higher self-esteem, resilience, and social support seeking predicted lower levels of loneliness; and 3) higher acculturative stress predicted loneliness. Overall, the directions of the paths of the risk and the protective factors were consistent with predictions.

Self-Esteem and Resilience. The analyses of the two predictor models of loneliness underscore the integral role of intrapersonal, dispositional factors in CIMC's adaptation. As our results show, both self-esteem and resilience were negative predictors of loneliness in the two models. A recent study of 411 Chinese migrant children and adolescents (grades 5 to 7) found

resilience to be negatively related to loneliness but positively related to social support and self-esteem (Song et al., 2018). Additionally, a study of late Chinese adolescents found that self-esteem negatively predicted loneliness (Kong & You, 2013). The current study not only lends support to these previous evidence concerning Chinese adolescents' loneliness, but also extends the findings with longitudinal data. In addition, the present findings further underscore the effects of self-esteem (Rosenberg et al., 1995; Vanhalst et al., 2013) and resilience (Humphreys, 2003) in enhancing well-being for children and youth.

Social Support. The protective quality of social support as a coping strategy for CIMC is further highlighted in both hypothesized models of loneliness. CIMC's social support seeking at Time 2 mediated the path between self-esteem at Time 1 and loneliness at Time 4 in Model #1, and between resilience at Time 1 and loneliness at Time 4 in Model #2. In fact, perceived level of social support has been repeatedly found to mitigate loneliness in young Chinese students in prior quantitative studies (e.g., Kong & You, 2013; Zhao et al., 2012). The importance of social support for CIMC was also highlighted in a qualitative study of ten Chinese migrant children and adolescents in the city of Wenzhou, China (Fang et al., 2016). Again, the current investigation extends existing evidence about the protective effects of social support for CIMC by revealing its impact on well-being temporally, across time (Kim, Sherman, & Taylor, 2008).

Acculturative Stress. Although acculturative stress has been implicated as a critical factor in the migration process (Berry, 1997; Kuo, 2014), no published CIMC research, known to the authors, has measured acculturative stress quantitatively, as was done in the present research. In this study, acculturative stress was a significant mediator between CIMC's self-esteem and resilience, and between self-esteem and loneliness. That is, CIMC with higher levels of self-esteem and resilience at the baseline (at T1) reported less acculturative stress a year later (at T3),

and less loneliness at the end of this study (at T4). These relationships are supported by findings with Chinese individuals undergoing cultural transitions (Kuo & Roysircar, 2006; Zhong et al., 2016). For instance, in a qualitative study, 14 of 17 adult Chinese migrant workers identified “no friends, lonely” as a significant stressor they faced in transitioning from rural areas to living and working in the city of Shenzhen, China (Zhong et al., 2016). Additionally, in a one-year longitudinal study of 680 CIMC, loneliness at T1 and T2 were negatively correlated with their sociocultural adaptation but positively correlated with identification with the host culture at both time points (Yuan, Fang, Liu, Hou, & Lin, 2013). In another word, CIMC who were less acculturated and who felt less accepted by the host society were likely experiencing more acculturative stress, which in turn led to their feeling of greater loneliness.

Moreover, in Model #1, a negative relationship between self-esteem at Time 1 and acculturative stress at Time 3 was indicated, suggesting that those with poorer self-esteem at baseline were more likely to experience greater stress in their rural-to-urban transition at a later point. This finding aligns with a study by Kim and Omoizo (2005), which found self-esteem to be a negative predictor of acculturative stress in Asian international students in the U.S. These findings point to acculturative stress as a risk factor for poorer well-being among CIMC.

Interestingly, contrary to our prediction in both models, the paths between social support seeking at Time 2 and acculturative stress at Time 3 were not significant. This finding may be an artifact of how acculturative stress was measured in the study, with the Chinese version of the SAFE-C. For example, some general and migration related stressors experienced by CIMC are not easily mitigated by having more social support, such as CIMC’s concern about their accent, doing well academically, getting sick, or missing one’s home of origin.

Conceptually-Informed Approach to Studying CIMC’s Adaptation

This study is the first CIMC research to adopt Heppner et al.'s (2012) CCMC framework, to analyze the interactions between migrant children's individual and environmental variables and their loneliness. In doing so, the present investigation bolsters the conceptual underpinning of the CIMC literature, and also extends the application of the CCMC. As follows, it is important for future CIMC research to: 1) study the interactions between dispositional (i.e., self-esteem and resilience) and contextual factors (rural-to-urban acculturation and migration experience); 2) incorporate culturally-relevant variables (i.e. acculturative stress) into the examination of the stress-coping-adaptation phenomenon; and 3) assess such a complex phenomenon with a longitudinal research design—all of which are methodological recommendations advocated by the proponents of CCMC (Heppner et al., 2012). In short, the current work offers empirical support for the growing literature on stress, coping and acculturation in migrant populations worldwide (Kuo, 2011, 2014; Ward & Geeraert, 2016). Future research on CIMC and other migrant populations should consider integrating and testing comprehensive conceptual frameworks, such as the CCMC and the Acculturation Theory.

Limitations

Despite the methodological and conceptual strengths of the present research, a number of limitations of this study need to be acknowledged in considering the study's results. First, while the study collected longitudinal data from a large sample of CIMCs, the four data points spanned only over 20 months. More significant changes in CIMC, including acculturative stress and loneliness, might have been observed over a longer stretch of time. It is, therefore, recommended that future studies assess migrant children's experiences over a longer term (e.g., three to five years). **Secondly, given that the intervariable relationships among the factors examined in this study were assessed based on correlations via path analysis, causal associations among these**

variables cannot be drawn and thus the study's findings require careful interpretation. Thirdly, the multivariate models in this study assessed only five variables that bear impacts on the well-being and adaptation of CIMC. Future researchers are encouraged to explore and examine other potential mediators and/or moderators of loneliness and adaptation, such as family relationships, academic stress, physical health, and discrimination, as suggested in the CIMC literature (e.g., Fang et al., 2017; Song et al., 2018; Wang & Mesman, 2015). Lastly, participants in the study were recruited exclusively from schools in Beijing. Clearly, the generalizability of this study's results cannot be ascertained without replicating the study in other urban areas in China.

Implications

On the research front, several implications are proposed here. While the variables and their relationships examined in the current study had been explored in previous research involving other sample populations (e.g., Kapikirn, 2013; Kim et al., 2008; Kuo & Roysircar, 2004; Vanhalst et al., 2013), this present study distinctively advances existing literature by testing, verifying, and extending these established relationships to an understudied yet rapidly growing migrant children population in China. For example, the positive effects of self-esteem (Rosenberg et al., 1995), resilience (Humphreys, 2003), and social support (Kim et al., 2008) on well-being identified in the extant literature were observed and confirmed in this longitudinal study with CIMC.

Further to that, the present study underscores the need to advance current CIMC research with more sophisticated research designs, echoing the calls of recent CIMC scholars (e.g., Fang et al., 2017; Song et al., 2018). This study is one of a handful of CIMC studies that used a prospective design (Sun et al., 2016), as such, more longitudinal research is needed to track the long-term effects of adaptation and well-being of CIMC. Moreover, several recent meta-

analytical reviews of published CIMC research (e.g., Chen et al., 2019; Sun et al., 2016; Wang & Mesman, 2015) have shown that this field of inquiry is dominated by quantitative research and data. Therefore, qualitative studies, such as interviews with migrant children and adolescents, can supplement quantitative findings on CIMC's adaptation with valuable lived experiences, going forward (Zhong et al., 2016).

On a practical level, the study's findings have intervention and policy implications for CIMC. In the present study, CIMC's self-esteem and resilience mitigated migrant children's risk for loneliness. It is, therefore, imperative that school personnel, as well as parents, pay close attention to migrant children who struggle significantly with self-esteem and resilience. This can be done either through systematic screening/evaluation of CIMC or through monitoring of CIMC psychosocial and emotional well-being and behaviours in school and at home. Considering the benefits of coping through social support and the adverse effects of acculturative stress, it would be productive for schools and/or migrant supporting organizations to offer psychoeducation and guidance for migrant children and their families. As a case in point, in a recent study by Tam et al. (2019), the authors reported a 6-session, group-based, resilience intervention for CIMC in two grade schools in the Chaoyang district of Beijing. These psychoeducation sessions included teaching migrant children positive migration-related expectations, adaptive coping strategies, cultural adaptation skills, and enhancing their social support and connection with significant others. Compared to a wait-list control group, CIMC completed this intervention program reported significant increase in their personal resilience and self-esteem. As follows, the findings of the current study lend further empirical support for this type of culturally-informed, strength-oriented guidance and support prevention and intervention for CIMC.

Moreover, parents, caregivers, and family of CIMC will also benefit from workshops or information on the rural-to-urban cultural transition process and associated acculturative stress, potential health and psychosocial impacts, adaptive stress response, and pragmatic resources to support their children's adjustment (Zhuang & Wong, 2017). Individual counseling and coaching for CIMC on skills to cope and manage acculturation-related stressors would also be highly valuable, to help guide them in navigating more effectively in their new settlement and strengthening their self-efficacy and self-esteem. In this regard, school counselors or social workers can serve as vital support and advocate for CIMC (Li & Jiang, 2018).

Lastly, continued advocacy for policy improvement and protection of Chinese internal migrants and their children have been voiced by previous researchers and service providers for this vulnerable population (Chen et al, 2019). This entails more open and accommodating policies, such as having more flexible *hukou* registration, improving health services and insurance coverage, and facilitating more inclusive communities for CIMC and their families, to name a few (Chen et al., 2019; Wang & Mesman, 2015). Collectively, these efforts will serve not only to reduce CIMC's social exclusion, isolation and loneliness, but also promote their resilience and overall health and well-being in the long run.

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Table 1. Demographic Characteristics of the Sample across Time 1 to Time 4

Time	N	Gender			Family income (M±SD)	School Grades			
		Boy	Girl	invalid		4 th	5 th	6 th	invalid
T1	862	478	368	16	4.51±1.68	271	250	331	10
T2	850	463	380	7	4.52±1.69	276	259	311	4
T3	906	538	368	0	4.29±1.75	318	283	300	5
T4	837	495	330	12	4.35±1.74	281	270	281	5

Family income: 1=below 500Yuan, 2=500~1000Yuan, 3=1000~2000 Yuan, 4=2000~4000 Yuan, 5=4000~6000 Yuan, 6=6000~8000 Yuan, 7= above 8000 Yuan.

Table 2. Correlations among the Key Variables of the Study

	1	2	3	4	5	6
1. Gender	1					
2. Resilience at T1	0.01	1				
3. Self-Esteem at T1	0.05	.56**	1			
4. Seeking Social Support at T2	-0.02	.32**	.32**	1		
5 Acculturative Stress at T3	-0.08	-.31**	-.45**	-.14**	1	
6 Loneliness at T4	-0.12*	-.37**	-.46**	-.24**	.40**	1
<i>Mean</i>	0.43	3.58	3.01	2.14	1.14	2.11
<i>Standard Deviation</i>	0.50	0.71	0.53	0.69	1.03	0.71

Note: Female = 0, Male = 1; Mean of gender represents the ratio of male. T1 = Time 1, T2 = Time 2, T3 = Time 3, T4 = Time 4. * $p < 0.05$, ** $p < 0.01$.

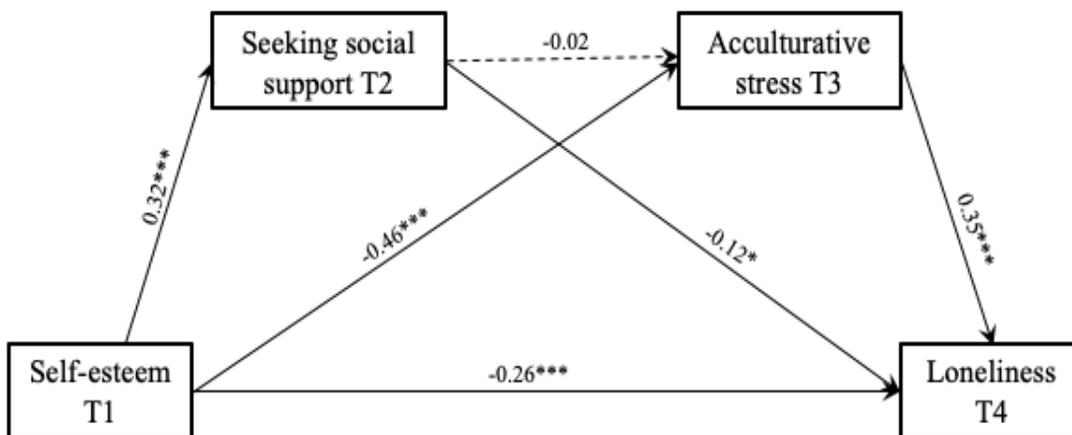


Figure 1. Hypothesized Model #1: Model of Self-esteem Predicting Loneliness through Seeking Social Support and Acculturative Stress

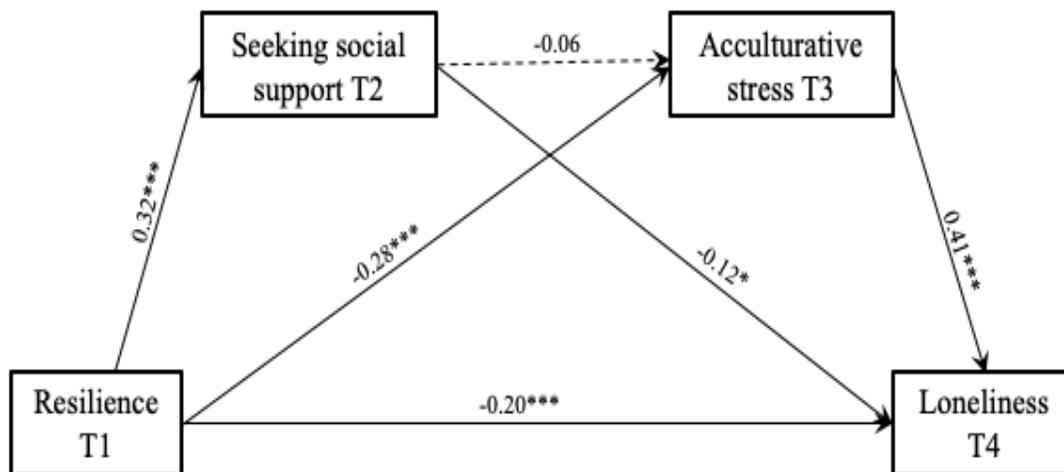


Figure 2. Hypothesized Model #2: Model of Resilience Predicting Loneliness through Seeking Social Support and Acculturative Stress